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ABSTRACT

Two hypotheses were developed in an attempt to organize and clarify the conceptual basis for studies of relationships between patterns of habitual sleep duration and self-perceptions of the need to achieve. A non-specific arousal (N-SA) hypothesis presumes that short sleepers show more vigor, more general anxiety, incline more toward development of the coronary-prone Type A personality, and are more "high drive" individuals than are long sleepers. A cognitive interference (CI) hypothesis presumes that short sleep interferes with cognitive efficiency and that short sleepers score lower on measures of fluid intelligence, lower on measures of divergent thinking, exhibit more external locus of control orientation, and develop more realistically and/or ego-defensively attenuated levels of aspiration and lower self-reported "need" for achievement than do long sleepers. This research design compares self-reported achievement need of short and "average" sleepers. A survey of college students indicated significantly weaker self-perceived achievement need among 32 short (6 hrs. or less per night) than among 32 average (8 hrs. per night) sleepers, thus supporting predictions from the CI hypothesis. A cue-utilization model integrating the theory and data relevant to these two hypotheses is discussed. (Author/RL)

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ABSTRACT

Two hypotheses were developed in an attempt to organize and clarify the conceptual basis for studies of relationships between patterns of habitual sleep duration and other individual difference traits. A survey study indicated significantly ($p < .01$) weaker self-perceived achievement need among 32 short (6 hrs. or less per night) than among 32 average (8 hrs. per night) sleepers, thus supporting predictions from a cognitive efficiency hypothesis, and not those from a non-specific arousal view. A cue-utilization model integrating the theory and data relevant to these two hypotheses is discussed.

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Habitual Sleep Duration and Self-Perceptions of the Need to Achieve[1]

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Recent research on habitual sleep duration has yielded some provocative findings, including those indicating the possible role of sleep styles in development of Type A behavior (Hicks, Pellegrini, Martin, Garbesi, Elliott, & Hawkins, 1979) and in stress management (Hicks, Lingen, & Eastman, 1979). The primary objective here is to suggest a preliminary theoretical framework to facilitate conceptualization and interpretation of data in this increasingly active area of inquiry. A secondary aim is to evaluate hypotheses derived from such a framework in a research design comparing characteristics of habitual sleep extreme and average sleepers. Up to now, the reported literature has focused exclusively on comparisons of extremely long and short sleepers, but has ignored the majority who typically sleep from about 7 1/2 to 8 1/2 hours per night. The present study explores the generality of relationships between habitual sleep duration and a particular dimension of personality, through this mid-range of the sleep duration continuum.

Results of research into individual differences in personality and cognition associated with patterns of habitual sleep duration seem to fit most clearly one or another of two hypotheses concerning the presumed effects of short sleep. The first of these we will refer to as the non-specific arousal hypothesis, which follows from observations indicating that whereas amount of NREM sleep remains relatively constant over a fairly wide span of variation in habitual sleep duration, amount of REM sleep is directly proportional to total habitual sleep duration (e.g., Cartwright, 1978). The non-specific arousal hypothesis thus assumes that habitual short sleepers are chronically REM deprived to some extent, and that they will tend to exhibit behaviors

congruent with the established effects of REM sleep deprivation (see Vogel, 1975). Most directly consistent with this view are psychometrically-determined findings such as the following:

(a) Spinweber & Hartmann's (1976) results showing significantly higher scores for short sleepers on a measure of vigor:

(b) results (Hicks & Pellegrini, 1977) indicating significantly higher scores for short than for long sleepers on a form of the TMAS, a scale widely-taken as a measure of general anxiety; and

(c) data indicating significantly stronger inclinations toward development of the coronary-prone Type A personality disposition among short than among long sleepers (Hicks, Pellegrini, Martin, Garbesi, Elliott, & Hawkins, 1979; Hicks, Lingen, & Eastman, 1979).

Moreover, these psychometric findings are reinforced by clinical impressions which, as Webb has put it,

> ...have repeatedly emphasized differences which are logically satisfying--short sleepers are "high drive" individuals whose pattern of sleep is correspondingly short either as a consequence or biological coordinate of such characteristics; long sleepers are appropriately coordinately "depressed" and "down" people (Webb, 1979, p. 264).

In addition to all of this, there is increasing empirical evidence for the idea that short sleep interferes with cognitive efficiency. What we will refer to as the cognitive interference hypothesis is supported by research findings such as these:

(a) significantly higher scores for long than for short sleepers on a measure of fluid intelligence (Hicks, Pellegrini, Cavanaugh, Sahatjian, & Sandham, 1978), an attribute defined as an intelligence factor representing a kind of good thinking in which reasoning is prominent (Horn, 1979);

(b) significantly lower scores for short than for long sleepers on a measure of divergent thinking (Hicks, Guista, Schretlen, & Pellegrini, 1980);

(c) a significantly more external locus of control orientation--i.e., seeing things as due to fate or luck rather than effort--among short sleepers (Hicks & Pellegrini, 1978), reflecting lower self-perceived competence to affect life outcomes as would be expected given their lower intellectual efficiency; and

(d) the finding that short sleepers are not generally anxious as inferred in an earlier study (Hicks & Pellegrini, 1977), but show significantly higher anxiety than long sleepers only on measures relevant to evaluations of their performance on tasks where intellectual functioning is an important factor (Hicks, Pellegrini, & Hawkins, 1979).

The two hypotheses do generate some contradictory predictions. For example, whereas the non-specific arousal view leads to the expectation of generally higher levels of anxiety among short sleepers, cognitive interference would predict, as found by Hicks, Pellegrini, & Hawkins, 1979, significant differences only on measures where intellectual efficiency is likely to be crucial. But they are far from mutually exclusive formulations. The conceptual overlap between them is illustrated by the fact that at least one finding classified above as fitting most closely with non-specific arousal could be accounted for, and even derived a priori, from cognitive interference. Thus, the greater Type A personality tendency among short sleepers could be attributed, as noted above, to higher levels of arousal. Alternatively, the lower intellectual efficiency of short sleepers could be seen as impeding development of effective coping mechanisms for managing life stress, with the resulting maladaptive style expressed as "Type A" behavior.

On the basis of the foregoing considerations, and in an attempt to clarify the relative status of these two hypotheses, the present study

compared achievement need self-perceptions of short and average duration sleepers. Need for achievement was chosen as the dependent measure because it is a variable on which quite clearly contradictory predictions follow from the two hypotheses. From the non-specific arousal perspective, one would expect generally higher levels of motivation and hence stronger expressed achievement needs in short than in longer sleepers. From the cognitive interference point of view, however, it is more plausible to expect that lower intellectual efficiency in short sleepers contributes to an experiential history of comparatively less success than for longer sleepers in performance-evaluated situations, out of which develops realistically and/or ego-defensively attenuated levels of aspiration and lower self-reported "need" for achievement.

METHOD

The relationship between habitual sleep duration and achievement need was tested by means of a self-report questionnaire administered anonymously to 500 college students, 250 males and 250 females. Habitual sleep duration was evaluated by the following series of questions: (1) "How many hours do you usually sleep each night?"; (2) "Are you satisfied with this amount of sleep?"; and (3) "How long have you had this sleep pattern?" The achievement-need variable was assessed by having respondents answer the following question on a 20-point Likert-type self-rating scale: "Generally speaking, how strongly-motivated are you to achieve in life?" The latter scale was anchored at the low end by 1 = "Not At All Strongly," and at the high end by 20 = "Very Strongly."

On the basis of methodological concerns as to the stability of sleep patterns (see Cartwright, 1978), we eliminated from further consideration all individuals who reported: (a) variable sleep duration habits; (b) dissatisfaction with their habitual sleep duration; or (c) having been into their reported sleep duration pattern for less than one year. The test sample was then constructed by selecting two groups at random from the remaining protocols: first, a short sleeping group of 16 females and 16 males who reported habitual sleep of 6 hrs. or less; and second, a group of 16 females and 16 males who reported a sleep habit of 8 hrs. per night, the latter being more characteristic of the "average" or "mid-range" of the sleep duration continuum. Short sleep was the habitual sleep extreme of principal interest here insofar as it is the one which is central to the theoretical rationales outlined above.

RESULTS AND DISCUSSION

The need achievement self-rating data summarized in Table 1 were analyzed in a 2 (Sex) x 2 (Sleep Duration) factorial analysis of variance, with both factors between subjects. This analysis revealed a statistically significant difference only for the main effect on Sleep Duration ($F = 7.33$, $df = 1/60$, $p < .01$). Neither the Sex factor nor the interaction were significant. The results of this study, indicating significantly weaker self-perceived needs for achievement among short than among average sleepers, thus supported predictions derived from the cognitive efficiency hypothesis and not those from the non-specific arousal view.

Insert Table 1 about here

These data further indicate relationships between personality and sleep duration. But they by no means allow for definitive conclusions as to the comparative validity of the hypotheses tested. In fact, it may prove most productive to view these two hypotheses as reliably conceptualizing aspects of short sleep which are differentially salient depending upon the measures employed. A quite plausible integration of this kind can be developed from the premise that cognitive interference effects of short sleep may be attributable to a dysfunctional narrowing of attention and corresponding exclusion of task-relevant cues which is caused by non-specific arousal.

Along these lines, Easterbrook (1959) has proposed a model which schematizes an inverted U-shaped function describing the relationship between performance and motivation or emotional arousal, wherein increasing arousal is assumed to steadily narrow attention through elimination of cues. The facilitative effects of increased arousal from a low to a moderate point are seen as due to a dropping-out of irrelevant cues, and the decrement in performance associated with still further increases in arousal beyond the moderate point is ascribed to elimination of task-relevant cues after more and more of the irrelevant ones have been selected out. Such a cue-utilization theory of habitual sleep duration clearly merits consideration in subsequent research.

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Table 1

Self-Ratings of Achievement Need

	Habitual Sleep Duration Group	
	6 hrs or less	8 hrs
Males	M = 15.81 SD = 3.89 n = 16	M = 17.88 SD = 2.96 n = 16
Females	M = 16.06 SD = 3.28 n = 16	M = 18.13 SD = 1.59 n = 16
All Respondents	M = 15.94 SD = 3.54 n = 32	M = 18.02 SD = 2.34 n = 32

Footnote

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